REMARKS

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 29 and 31-33 are pending in the application, with claim 29 being the independent claim. Claims 1-28 and 30 have been canceled without prejudice and Applicants reserve the right to file said claims in another application. These changes are believed to introduce no new matter, and their entry is respectfully requested.

The above Amendment places the claims in better form for consideration on appeal and therefore, should be entered.

Based upon the above Amendment, attached Declaration, and the following Remarks, the Applicants respectfully request the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Specification:

The Examiner has asserted that the specification contained sequence disclosures (Figures 6A, 6B, 7, 11) that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 C.F.R. §1.821(a)(1) and (a)(2), but are not present in the Sequence Listing and/or identified in the specification by sequence identifier numbers.

Applicants have herewith submitted an amendment that requests insertion of sequence identifier numbers for those sequences listed in Figures 6A, 6B, 7, and 11. Further, Applicants herewith submit a new sequence listing and computer readable copy to replace the previously filed sequence listing. The new sequence listing corrects a minor typographical error with respect to sequence 75, where the 11^{th} base should be "g" not "c." The correct sequence is set forth in Figure 11. Based upon the amendments and current filings, which includes a statement

to support the filing and submission, sequences listed in the instant application comply with 37 C.F.R. §§1.821 - 1.825.

Therefore, the Applicants believe that the above amendments and herewith submitted amended Sequence Listing fully comply with the requirements for nucleotide/amino acid sequences and respectfully request the objection be withdrawn.

Rejection under 35 U.S.C. § 101:

The Homozygous Stem Cells of the present invention are obtainable by the claimed method and provide homozygous stem cell lines that are homozygous for unique MHC haplotypes and histocompatible with any individual carrying the components of such haplotypes for the purpose of having a constant, reliable, comprehensive supply of cells for study, diagnosis, transplant, and/or treatment.

Claims 29, 31 and 32 stand rejected under 35 U.S.C. §101 because the Examiner asserts that the specification and references cited in the previous response to Office Action (Kaufman, *et al.*, J. Embryol. Exp. Morph., 73:249-261 (1983) and Taylor, *et al.*, Hum. Reprod., 9(12):2389-2397 (1994)) fail to support the assertion that human homozygous pluripotent stem cells are obtainable by the claimed method (from human parthenogenetic embryonic inner cell mass) so that a practical utility can be well established. Specifically, the Examiner asserts that even if the human HS cells are obtainable, the only utility for establishing a cell depository is to carry out further research characterizing the homozygous stem cells, which is not considered specific and substantial. The Examiner also asserts that the Lin, *et al.* reference (Stem Cells, 21:152-161 (2003)) only shows "proliferating cells," not the verification of their pluripotency and pages 22 and 45 of the specification refer to the teachings of Kaufman, *et al.* and Taylor, *et al.* The

Examiner asserts that Kaufman, *et al.* teaches pluripotent cell lines from mouse embryos and that Taylor, *et al.* shows that although the timing of developmental events is similar to that seen in fertilized oocytes, the developmental potential of human parthenogenetic embryos was reduced, and the majority of those allowed to continue in culture, arrested between the 2-cell and 8-cell stages. The Examiner also asserts that Taylor, *et al.* is silent concerning whether these cells are capable of establishing as pluripotent stem cells.

Applicants respectfully request reconsideration and withdrawal of this rejection in view of the attached Declaration and the following Remarks. Applicants submit that the pending claims have a substantial and specific utility.

According to the Federal Register, an invention has a well-established utility if a person of ordinary skill in the art would immediately appreciate why the invention is useful based on the characteristics of the invention. Fed. Reg., Vol. 64, No. 244, December 21, 1999. An applicant need only provide one credible assertion of specific and substantial utility for each claimed invention to satisfy the utility requirement. Fed. Reg., Vol. 64, No. 244, December 21, 1999. To satisfy the requirements of 35 U.S.C. §101, an applicant must claim an invention that is statutory subject matter and must show that the claimed invention is "useful" for some purpose either explicitly or implicitly. MPEP § 2107.01. According to the Federal Circuit, "[t]o violate [35 U.S.C.] 101 the claimed device must be totally incapable of achieving a useful result." *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1571 (Fed. Cir. 1992). See also *E.I. du Pont De Nemours and Co. v. Berkley and Co.*, 620 F.2d 1247, 1260 n.17 (8th Cr. 1980) ("A small degree of utility is sufficient... The claimed invention must only be capable of performing some beneficial function...An invention does not lack utility merely because the particular embodiment disclosed in the patent lacks perfection or performs crudely...A

commercially successful product is not required...Nor is it essential that the invention accomplish all its intended functions...or operate under all conditions...partial success being sufficient to demonstrate patentable utility...In short, the defense of non-utility cannot be sustained without proof of total incapacity.")

According to the declaration herewith attached, the inventors attest to the fact the instant invention has a substantial and specific utility, namely, of providing HS cell lines, homozygous for unique MHC haplotypes and histocompatible with any individual carrying the components of such haplotype for the purpose of having a constant, reliable, comprehensive supply of cells for study, diagnosis, transplant, and/or treatment, i.e. cell replacement and/or gene therapy. *See also* Specification, pp. 4-5. Further, the declaration sets forth the success of creating pluripotent stem cells using the methods disclosed in the instant specification, which more than satisfies the test under *Brooktree Corp.* by illustrating that the claimed invention not only works, but is useful for such treatments as cell replacement and gene therapy. As also stated in the declaration, the cells are already characterized by MHC haplotypes and therefore no further research is required for characterizing the HS cells.

With respect to the specification citing Kaufman, *et al.* and Taylor, *et al.*, those references are cited in the specification for the premise that haploid oocytes resulting from activation are able to self-replicate their genome without cytokinesis and give rise to diploid cells. These references were used to illustrate what the term "post-meiosis I diploid germ cell" means. Further, the methods disclosed in the specification gave rise to homozygous pluripotent stem cells.

As the Examiner pointed out in the previous Office Action, example 1(b) to 1(e) shows that various methods were used to verify that the cells obtained from the mass were indeed

pluripotent, i.e. capable of developing into three layers, ectoderm, mesoderm, and endoderm. This disclosure coupled with the declaration illustrates that the invention indeed works and is enabled by the specification.

Therefore, the Applicants believe that with the declaration and the disclosure of the specification, the instant invention has set forth more than one utility, which is more than required by case law, and have shown that the claimed invention does in fact work and is enabled by the specification, such that one of ordinary skill in the art would understand the claimed invention and would not be required to perform undue experimentation. Applicants respectfully request the above rejection be withdrawn.

Rejection under 35 U.S.C. §112, 1st paragraph:

The claimed invention is enabled by the specification, such that one of ordinary skill in the art would know how to use the claimed invention without undue experimentation because others have followed the teachings of the instant application and successfully created pluripotent stem cell lines.

Claims 29, 31 and 32 stand rejected under 35 U.S.C. §112, 1st paragraph, because the Examiner asserts that since the claims were rejected under 35 U.S.C. §101 for not being supported by either a credible asserted or a well established utility for the reasons set forth above, one skilled in the art would not know how to use the claimed invention so that it would operate as intended without undue experimentation.

Applicants respectfully request reconsideration and withdrawal of this rejection in view of the Remarks set forth above. Applicants submit that the pending claims are enabled by the specification.

Rejection under 35 U.S.C. §112, 1st paragraph:

The claimed invention is enabled by the specification, such that one of ordinary skill in the art would know how to use the claimed invention without undue experimentation because others have followed the teachings of the instant application and successfully created pluripotent stem cell lines.

Claims 29, and 31-33 stand rejected under 35 U.S.C. §112, 1st paragraph, as failing to comply with the enablement requirement because the Examiner asserts that the specification fails to provide evidence to the contrary of the cited art of record that human pluripotent stem cells cannot be created by the methods in the instant specification. Specifically, the Examiner cites Newman-Smith, *et al.* (Development, 21:2069-2077 (1995))and Park, *et al.* (Jpn. J. Vet. Res., 46(1):19-28 (May 1998)) because they allegedly teach that stem cells obtained from parthenogenetic peri-implantation embryos are defective and the parthenogenetic embryonic stem cells retarded in growth showed restricted differentiation compared to their fertilized counterpart. Further, the Examiner asserts that the other references are consistent with the Taylor, *et al.* reference.

Applicants respectfully request reconsideration and withdrawal of this rejection in view of the attached Declaration and the following Remarks. Applicants submit that the pending claims are enabled by the specification.

As discussed above and stated in the attached declaration, an inventor has set forth that the methods disclosed in the specification are successful at creating pluripotent homozygous stem cells. The Examiner relies on the Newman-Smith, *et al.* and Park, *et al.* reference to support the premise that human pluripotent stem cells cannot be successfully made and that the

specification does not enable the claimed invention. Applicants respectfully disagree. Despite the inability of the authors of the Newman-Smith, *et al.* and Park, *et al.* references to create parthenogenetic mouse embryos, the Applicants have described how the methods disclosed in the specification were successful in creating homozygous pluripotent mouse stem cells. Further the Applicants have shown that others, following the methods disclosed in the specification were also able to successfully create stem cells that are pluripotent.

The Examiner also points out with the Draper, *et al.* reference, that human ES cells are distinct from mouse cells in many aspects. The Examiner uses Draper, *et al.* to argue that techniques using mouse embryos may not work for human cells. However, the Examiner also uses the Newman-Smith, *et al.* and Park, *et al.* references to support the premise that since the authors of the two references were unable to create pluripotent mouse stem cells, that that too means human stems cells cannot be made. The Examiner should not be permitted to make the argument that since Newman-Smith, *et al.* and Park, *et al.* could not make pluripotent mouse stem cells, that the instant specification is not enabled for human stem cells and then use Draper, *et al.* to show that there is a difference between mouse and human stem cells, so one method that may work for the mouse may not work for human. Although, Draper, *et al.* acknowledges differences of expression patterns of some antigens presented by early stage mouse and human embryos, and human and mouse inner cell mass derived embryonic stem cells, the degree of differences is unknown. However, the inventors of the present invention, using the methods disclosed in the specification were able to successfully activate cells to create homozygous pluripotent stem cells. Further, others have also been successful at creating pluripotent stem cells by following the methods disclosed in the instant specification. *See* attached declaration.

It should also be pointed out that although the Taylor, *et al.* reference showed a reduce rate and eventual cell arrest, it still shows the ability to parthenogenetically activate human oocytes. The inventors were able to go beyond the references using the methods in the instant specification to create homozygous pluripotent stem cells from parthenogenetically activated oocytes, as is supported by the specification and attached declaration. The references only illustrate the difficulty that many had in the art, which the Applicants have overcome.

Therefore, the Applicants have enabled the methods for creating HS cell depositories pluripotent and homozygous with respect to MHC.

Rejection under 35 U.S.C. §112, 2nd paragraph:

The claims have been amended to reflect that the stem cells are homozygous with respect to MHC haplotypes and therefore are definite.

Claims 29 and 31-33 stand rejected under 35 U.S.C. §112, 2nd paragraph, as being indefinite because of the term "homozygous stem cells." The Examiner has pointed out that it is clear that the claimed stem cells are homozygous with respect to MHC.

Applicants have amended the claims to reflect that the stem cells are homozygous with respect to MHC. As such, Applicants respectfully request the rejection be withdrawn.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant(s) therefore respectfully request(s) that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner

believes, for any reason that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Response is respectfully requested.

Respectfully submitted,

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Date: 12/20/04

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